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EXAMINER

NGUYEN, LUONG TRUNG

ART UNIT

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2622

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/747,741	<b>Applicant(s)</b> UENO ET AL.	
	<b>Examiner</b> LUONG T. NGUYEN	<b>Art Unit</b> 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 16-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 16-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on 07/06/2009 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of the full statutory term prior patent No. 7,352,401 has been reviewed and is accepted. The terminal disclaimer has been recorded. Therefore, the double patenting rejection as made on 01/06/2009 has been withdrawn.

### ***Response to Arguments***

2. Applicant's arguments filed on 07/06/2009 with respect to prior art rejections have been fully considered but they are not persuasive.

In re page 5, Applicants argue that neither Gowda nor Tanaka teach or suggest the subject matter of the presently claimed invention wherein the threshold voltage of the amplifier transistor is reduced in relation to the remaining transistors of the pixels.

In response, regarding claim 16, Applicants amended claim 16 with limitation “wherein a threshold voltage of said amplifying element is reduced in relation to remaining transistors of each pixel.” Noted that claim 16 as amended does not indicate **how** the relation between the threshold voltage of said amplifying element is reduced in relation to remaining transistors of each pixel; therefore, the Examiner considers that claim 16 as amended still broadly read by Tanaka. Tanaka et al. teaches an image sensor, in which the amplifying transistor has a low threshold voltage, this indicates that the threshold voltage of the amplifying is reduced (column

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16, lines 50-55), and noted that each unit cell (pixel) in Figure 7 includes other transistors such as reset transistor 96, read-out transistors 93a, 93b in addition to amplifying transistor 94; all these transistors are connected each other (i.e., relation to each other); this indicates that the threshold voltage of the amplifying 94 is reduced in relation to reset transistor 96, read-out transistors 93a, 93b (column 16, lines 30-60).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 16-18, 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gowda et al. (US 5,898,168) in view of Tanaka et al. (US 6,674,470).

Regarding claim 16, Gowda et al. discloses a solid state imaging element (imager 20, figures 3A-3B) comprising:

a pixel (cell 30; figures 3A-3B; column 4, lines 9+) to which has a photoelectric transfer element (photodiode 26, figure 3B, column 4, lines 9-20), a transfer switch (FET 22, figure 3B, column 4, lines 9-36) for transferring charge stored in said photoelectric transfer element, a charge store part (circuit node 25, figure 3B, column 4, lines 37-62) for storing charge transferred by said transfer switch, a reset switch (reset transistor 21, figure 3B, column 4, lines 20-62) for resetting said charge store part, and an amplifying element (FET 23, figure 3B,

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column 4, lines 9-36) for outputting signal in accordance with the potential of said charge store part to vertical signal lines (column buses 15j, figures 3A-3B, column 4, lines 9-62).

Gowda et al. fails to specifically disclose wherein a threshold voltage of said amplifying element is reduced in relation to remaining transistors of each pixel. However, Tanaka et al. teaches an image sensor, in which the amplifying transistor has a low threshold voltage, this indicates that the threshold voltage of the amplifying is reduced (column 16, lines 50-55); and noted that each unit cell (pixel) in Figure 7 includes other transistors such as reset transistor 96, read-out transistors 93a, 93b in addition to amplifying transistor 94; all these transistors are connected each other (i.e., relation to each other); this indicates that the threshold voltage of the amplifying 94 is reduced in relation to reset transistor 96, read-out transistors 93a, 93b (column 16, lines 30-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Gowda et al. by the teaching of Tanaka et al. in order to obtain a solid state imaging device which have a wide amplifying function (column 16, lines 50-52).

Regarding claim 17, Gowda et al. discloses wherein said transfer switch is an enhancement type transistor (FET 22, figure 3B, column 4, lines 9-36).

Regarding claim 18, Gowda et al. discloses wherein said amplifier is an enhancement type transistor (FET 23, figure 3B, column 4, lines 9-36).

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Regarding claims 20-22, Tanaka et al. discloses wherein the amplifying element operates linearly across its entire range of operation (Tanaka et al. discloses an image sensor, in which the amplifying transistor has a low threshold voltage, this indicates that the threshold voltage of the amplifying can be reduced and can be linearly operated, column 16, lines 50-55).

5. Claims 19, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pain et al. (US 5,886,659) in view of Tanaka et al. (US 6,674,470).

Regarding claim 19, Pain et al. discloses a solid state imaging element (figures 1A-1C, 3A, 4; column 3, lines 55+; column 6, lines 10+) comprising:

a pixel (pixel in pixel array 410; figure 4; column 6, lines 50+) to which has a photoelectric transfer element (figures 2A, 3A; photodiode 210, photogate 310; column 6, lines 14-33), a transfer switch (transfer gate electrode 320, figure 3A; column 6, lines 25+) for transferring charge stored in said photoelectric transfer element, a charge store part (floating diffusion 330, figure 3A; column 6, lines 25+) for storing charge transferred by said transfer switch, a reset switch (reset electrode 340; figure 3A; column 9, lines 25+) for resetting said charge store part, and an amplifying element (transistor 360, figure 3A; column 3; lines 55-60) for outputting signal in accordance with the potential of said charge store part to vertical signal lines (figures 3A, 4; column 6; lines 24+);

wherein negative voltage is applied to the gate of said reset switch (column 6, lines 40-43).

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Pain et al. fails to specifically disclose wherein a threshold voltage of said amplifying element is reduced in relation to remaining transistors of each pixel. However, Tanaka et al. teaches an image sensor, in which the amplifying transistor has a low threshold voltage, this indicates that the threshold voltage of the amplifying is reduced (column 16, lines 50-55); and noted that each unit cell (pixel) in Figure 7 includes other transistors such as reset transistor 96, read-out transistors 93a, 93b in addition to amplifying transistor 94; all these transistors are connected each other (i.e., relation to each other); this indicates that the threshold voltage of the amplifying 94 is reduced in relation to reset transistor 96, read-out transistors 93a, 93b (column 16, lines 30-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Pain et al. by the teaching of Tanaka et al. in order to obtain a solid state imaging device which have a wide amplifying function (column 16, lines 50-52).

Regarding claim 23, Tanaka et al. discloses wherein the amplifying element operates linearly across its entire range of operation (Tanaka et al. discloses an image sensor, in which the amplifying transistor has a low threshold voltage, this indicates that the threshold voltage of the amplifying can be reduced and can be linearly operated, column 16, lines 50-55).

### ***Conclusion***

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6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUONG T. NGUYEN whose telephone number is (571) 272-7315. The examiner can normally be reached on 7:30AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID L. OMETZ can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LUONG T NGUYEN/  
Examiner, Art Unit 2622  
11/07/09